Application No.: 10/682,154

REMARKS

Applicants have carefully considered the January 27, 2006 Office Action, and the amendments above together with the comments that follow are presented in a bona fide effort to address all issues raised in that Action and thereby place this case in condition for allowance. Claims 1 and 4-23 were pending in this application. Claims 4-7 and 10-19 have been withdrawn from consideration pursuant to the provisions of 37 C.F.R. § 1.142(b).

In response to the Office Action dated January 27, 2006, claims 1, 20 and 23 have been amended and new claims 24-31 have been added. Care has been exercised to avoid the introduction of new matter. Adequate descriptive support for the present Amendment should be apparent throughout the originally filed claims and the related discussion thereof in the written description of the specification. Applicants submit that the present Amendment places the application in condition for allowance and does not generate any new matter issue or any new issue requiring any further search and/or consideration. Accordingly, entry of the Amendment and prompt favorable reconsideration are respectfully requested.

Claims 1, 8, 9 and 20-23 were rejected under 35 U.S.C. § 102(b) as being anticipated over Terasawa (U.S. Pat. No. 6,002,143, hereinafter "Terasawa"). Applicants respectfully traverse the rejection for the reasons discussed *infra*. There are significant differences between the claimed inventions and the device disclosed by Terasawa that would preclude the factual determination that Terasawa identically describes the claimed inventions within the meaning of 35 U.S.C. § 102.

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Independent Claim 1

In Terasawa, there is no disclosure or suggestion of a drain region made of a substrate of a first semiconductor having a bandgap energy wider than a second semiconductor as required in claim 1. As depicted in Fig.7, the drain region of Terasawa is made of the N^+ type silicon substrate 11, because a drain electrode 18 is formed on a rear surface of the silicon substrate 11. See Terasawa at col. 5, lines 50-52. In Terasawa, the N type diffusion layer 41 has a higher impurity concentration than that of the silicon carbide layer 12 formed between the N^+ type silicon substrate 11 and the N^- type silicon carbide layer 12. The N type diffusion layer 41 is formed by diffusing impurity ions from the silicon substrate 11 into the silicon carbide layer 12 after epitaxially depositing the silicon carbide layer 12. Because the bandgap energy of silicon carbide is wider than bandgap energy of silicon, it is evident that substrate 11 of Terasawa corresponds to the claimed second semiconductor. As disclosed in column 2, line 55 to column 3, line 13 and claim 1, "a hybrid structure" semiconductor substrate including a first substrate made of silicon and a second semiconductor substrate made of a semiconductor material having a band gap wider than that of the first substrate of silicon is an essential feature of the invention disclosed in Terasawa.

Independent Claim 20:

In Terasawa, there is no disclosure or suggestion of preparing a substrate made of a first semiconductor as required in claim 20. As stated above, because the drain region of Terasawa is made of the N^+ type silicon substrate 11, the substrate 11 of Terasawa corresponds to the second semiconductor of claim 20.

Therefore, Terasawa fails to show claimed homo-epitaxially growing a first layer made of the first semiconductor on a surface of the substrate made of claimed first semiconductor.

Terasawa discloses (column 2, line 55 to column 3, line 13 and claim 1) "a hybrid structure" semiconductor substrate including a first substrate made of silicon and a second semiconductor substrate made of a semiconductor material having a band gap wider than that of the first substrate of silicon, and such an arrangement is an essential feature of the invention disclosed in Terasawa. Applicants submit that Terasawa cannot achieve the claimed homo-epitaxial growth.

Furthermore, Terasawa fails to disclose or suggest (1) forming a pattern of an insulating film having a first window portion exposing partially a surface of the first layer; or (2) growing a second layer made of a second semiconductor having a bandgap energy narrower than the first semiconductor on the insulating film and, through the first window portion, on the surface of the first layer so as to form a heterojunction interface between the first and second semiconductors.

Independent Claim 23

In Terasawa, there is no disclosure or suggestion of a means for providing a constant first band gap energy between the band-edge discontinuity barrier and the drain electrode, and receiving the carriers injected by tunneling through the band-edge discontinuity barrier, being contacted with the drain electrode, as required by claim 23. Terasawa discloses (column 2, line 55 to column 3, line 13 and claim 1) "a hybrid structure" semiconductor substrate including a first substrate made of silicon and a second semiconductor substrate made of a semiconductor material having a band gap wider than that of the first substrate of silicon and that such an arrangement is an essential feature of the invention. It should be evident, therefore, that Terasawa is not capable of providing a constant first band gap energy between the band-edge discontinuity barrier and the drain electrode as required in claim 23.

The above argued differences between the present claimed subject matter and that of Terasawa's device undermine the factual determination that Terasawa discloses a device or

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method identically corresponding to that claimed in independent claims 1, 20 and 23. *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 230 U.S.P.Q. 86 (Fed. Cir. 1986). Applicants, therefore, submit that the imposed rejection of claims 1, 8, 9 and 20-23 under 35 U.S.C. § 102 for lack of novelty as evidenced by Terasawa is not factually viable and, hence, solicit withdrawal thereof.

New dependent claims 24-29 are free from the applied art in view of their dependency from independent claim 1. Applicants further submit that independent claims 30 and 31 are patentably distinct over the art of record.

It is believed that all pending claims are now in condition for allowance. Applicants therefore respectfully request an early and favorable reconsideration and allowance of this application. If there are any outstanding issues which might be resolved by an interview or an Examiner's amendment, the Examiner is invited to call Applicants' representative at the telephone number shown below.

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To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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